

# PATENT SPECIFICATION

707,768



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## COMPLETE SPECIFICATION

### Improvements in or relating to Watches

We, WILHELM JULIUS HANHART, and MARIE HANHART, both Swiss Nationals, trading as ADOLF HANHART UHRENFABRIKEN, of Gutenbach/Schwarzwald, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention concerns stopwatches or chronometers, in particular ordinary wrist or pocket watches adapted to be used also as stopwatches.

There are already known various chronometers which have the disadvantages of being both complicated and expensive.

Similarly, cheaper types are known, of which a good example is one wherein the watch is operated simply by stopping the balance.

In this latter type of watch, the stop or chronograph hand cannot be brought back to the zero position in one jump, so that it is a time consuming process to reset the said hand.

It is an object of the present invention to provide a stopwatch, or chronometer of simple construction and operation, which is comparatively cheap to manufacture, and which combines the essential features of an expensive instrument in that the stop or chronograph hand may be returned to its zero position in one jump.

The present invention comprises a watch for use also as a stopwatch and having an auxiliary gear train to drive an auxiliary stop hand, wherein a control hammer pivoted within the watch is operable by two members actuated from outside the watch casing, one member operating said control hammer to disengage the auxiliary stop hand from the watch movement and the other member operating the same control hammer first to reset the auxiliary stop hand at zero, and then to re-engage the auxiliary stop hand with the watch movement.

[Price 2/8]

Preferably one of the pinions of the auxiliary gear train is mounted on a lever to which angular movement is applied by the control hammer on actuation of the first operating member, thereby moving said pinion out of mesh to interrupt the drive to the stop hand.

The invention will be further described with reference to the accompanying drawings 55 in which:—

Fig. 1 is a front view of a watch constructed according to the present invention;

Fig. 2 is a rear view of the watch shown in Fig. 1, showing the mechanism for the 60 auxiliary stop hand in the position wherein a time measurement would be indicated by said hand;

Fig. 3 is a further rear view of the watch shown in Fig. 1. In this case, the auxiliary 65 stop hand mechanism is shown in its position wherein a measurement of time is being carried out;

Fig. 4 is another rear view of the watch shown in Fig. 1. This figure shows the position of auxiliary stop hand mechanism at the instant when the hand has been returned to its zero position;

Fig. 5 is a cross-section of the watch taken in the line V—V of Fig. 4.

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In the figures, 1 denotes the second hand driving pinion. This pinion 1 is driven by normal watch movement (not shown) and may be employed to drive a small second hand (not shown) on the lower part of the 80 face of the watch in known manner.

This second hand driving pinion 1 meshes with a transmission pinion 3 which is carried upon a coupling yoke 4 of resilient metal. The yoke 4 is fastened to the watch frame 85 6, at one end only, by means of a screw 5. An auxiliary stop or chronograph hand 8 for the purpose of time recording is in the form of a centre seconds hand. The hand 8 is mounted in known manner to be driven by a 90 pinion 7.

The transmission pinion 3 is mounted upon

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the coupling yoke 4 in such a way that in one of the positions of the yoke 4, the three pinions 1, 3 and 7 form a gear train whereby the auxiliary hand 8 may be driven from the watch movement. The relevant position of the yoke 4 is shown in Fig. 3. Displacement of the coupling yoke 4 away from the pinion 7 will effect a disengagement of said pinion from the watch movement.

Displacement of the coupling yoke 4, and the attendant engagement and disengagement of the pinion 7 from the watch movement is effected by means of a hammer of substantially bell-crank lever shape denoted generally by the reference numeral 10 which is pivoted to the watch frame 6 by a screw 9. A spring arm 11, which is also attached to the watch frame, 6, bears against a projection on the hammer 10 to resiliently urge it about its pivot in a counter-clockwise direction as viewed in Figs. 2, 3 and 4.

The hammer 10 includes a lever carrying a cranked portion 12, 14 into which is incorporated a curved face 13. The face 13 and the straight member 14 form together a catch angle or cam face, which, in use, co-operates with a pin 15 eccentrically disposed upon the pinion 7.

Displacement of the hammer 10 in a clockwise direction against the action of the spring arm 11 will cause the pin 15 to be engaged by the catch angle 13, 14, whereby the pinion 7 will be partially rotated and the auxiliary hand 8 will be brought to the zero position as shown in Fig. 4.

A curved segment 16 on the hammer 10 is adapted to engage and form a bearing surface for a nose portion 17 on the coupling yoke 4, whereby when the nose 17 is engaging the segment 16, the yoke 4 is held in a displaced position and the gear train 1, 3, 7 is disengaged.

A screw 18 forms a stop for the end of the coupling yoke 4, and when the yoke 4 is in the position where its end is bearing against said stop, the gear train 1, 3, 7 is in engagement, as shown in Fig. 3. The coupling yoke 4 can only be in this latter position when its nose 17 is not in engagement with the segment 16.

A detent lever 20 is pivotally attached to the watch frame 6 by means of a screw 21. This lever is resiliently urged in a clockwise direction about its pivot 21 by a second spring arm 22. The extremity of the detent lever 20 is tapered, and is adapted to co-operate with a niche 19 in the straight member 14.

The detent lever 20 may be manually displaced in an anti-clockwise direction by means of a stopping button 27 which is pivotally connected thereto at pivot 23.

Similarly, the hammer 10 may be manually displaced in a clockwise direction by means of a starting button 28 which is pivotally connected thereto at pivot 25.

In use the mechanism of the watch operates as follows:—

#### 1. *Stopping the watch.*

Fig. 3 shows the position of the mechanism of the watch in operation, with the second hand pinion 7 being rotated by the watch movement in order to measure time. The watch may be stopped by pressing the stopping button 27 in the direction 24. The detent lever 20 is thereby rotated in an anti-clockwise direction, until the tapered part of the lever 20 engages in the niche 19.

At the same time, the rotation of the hammer 10 causes the nose 17 of the coupling yoke 4 to engage upon the segment 16, thereby disengaging the gear train 1, 3, 7, so that the auxiliary stop hand is disengaged from the watch movement. The measured time can now be read on the dial from the auxiliary stop hand.

The position of the mechanism now corresponds with that shown in Fig. 2.

#### 2. *Returning the auxiliary stop hand to its zero position.*

To use the stopwatch again, it is necessary to return the hand 8 back to its zero position. This is done by pressing the starting button 28 in the direction 26.

The hammer 10 is rotated about its pivot 9 in a clockwise direction as shown by the 95 arrow in Fig. 2. The detent lever 20 is released from the niche 19 by this rotation. As the hammer 10 is further rotated, the catch angle 13, 14 engages with the pin 15 on the pinion 7, to rotate said pinion 7 thereby bringing the auxiliary stop hand to its zero position. This position is shown in Fig. 4.

The stopping button 27 is now depressed once more, and the starting button is then released. The hammer 10 is therefore urged in a counter-clockwise direction by the force of the spring arm 11, until the niche 19 once again re-engages with the tapered end of the detent lever 20. The nose 17 of the coupling yoke 4 remains in contact with the segment 16, so that the gear train 1, 3, 7 is disengaged, and the pinion 7 remains stationary.

The watch is now ready for the commencement of a further time measurement.

#### 3. *Starting the second hand.*

The watch may now be started, simply by quickly pressing the starting button 28 in the direction of the arrow 26 to displace the hammer 10 sufficiently to disengage the detent lever 20 from the niche 19. The detent lever 20 is then rotated in a clockwise direction under the influence of the second spring arm 22 to its inoperative position. The hammer 10, under the influence of its spring arm 11 is rotated in a counter-clockwise direction to its full extent. Meanwhile the nose 17 of the coupling yoke 4 disengages from the segment 16, and the end of the yoke 4 engages the stop 18. The gear train 1, 3, 7 therefore becomes engaged, and the 130

auxiliary stop hand commences to be driven from the watch movement.

The mechanism is now in the position shown in Fig. 3, and processes previously described may be repeated.

As can be seen from the figures, the operation and construction of a stopwatch according to the present invention is extremely simple. The elements described may be assembled into a unit for incorporation into an ordinary watch, or they may be built into an ordinary watch using the existing watch frame.

What we claim is:—

1. A watch for use also as a stopwatch and having an auxiliary gear train to drive an auxiliary stop hand, wherein a control hammer pivoted within the watch is operable by two members actuated from outside the watch casing, one member operating said control hammer to disengage the auxiliary stop hand from the watch movement and the other member operating the same control hammer first to reset the auxiliary stop hand at zero and then to re-engage the auxiliary stop hand with the watch movement.

2. A watch according to Claim 1, wherein one of the pinions of the auxiliary gear train is mounted on a lever to which angular movement is applied by the control hammer on actuation of the first operating member, thereby moving said pinion out of mesh to interrupt the drive to the stop hand.

3. A watch according to Claim 2 wherein the control hammer comprises a lever of sub-

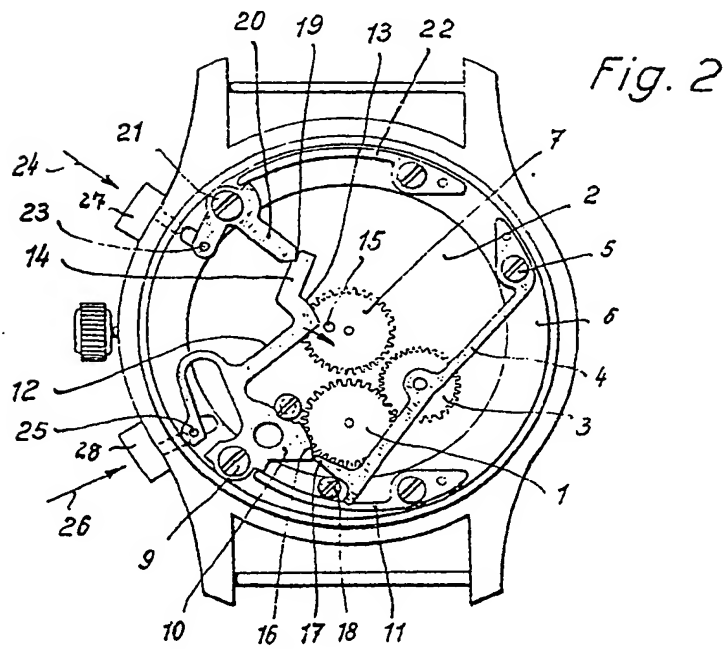
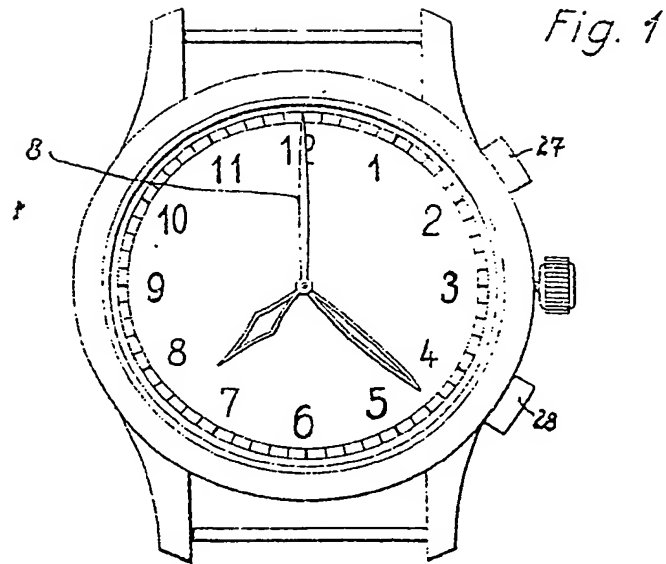
stantially bell-crank shape, one limb of which is adapted to engage the pinion-carrying lever and impart the drive interruption movement thereto on operation of the said first actuating member.

4. A watch according to Claim 3 wherein the other limb of the bell-crank lever is cranked at its outer end to provide a cam face adapted to co-operate, upon operation of the said lever by the other actuating member, with a pin on the pinion on the stop hand shaft to return the stop hand to its zero position said lever also being adapted to maintain the pinion-carrying lever in drive-interrupted position.

5. A watch according to either of the preceding Claims 3 or 4, wherein detent means are provided adapted to hold the bell-crank lever in a position in which, whilst the stop hand is in the zero position, the interruption of the drive is maintained, the detent means being disengaged from the bell-crank lever upon actuation of the second actuating member to allow the pinion-carrying lever to restore the drive to the stop hand.

6. A watch for use also as a stopwatch constructed, arranged and adapted to operate substantially as herein described with reference to and as illustrated in the accompanying drawings.

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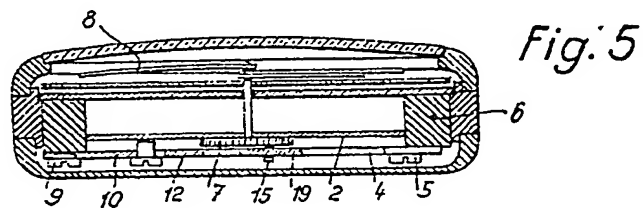
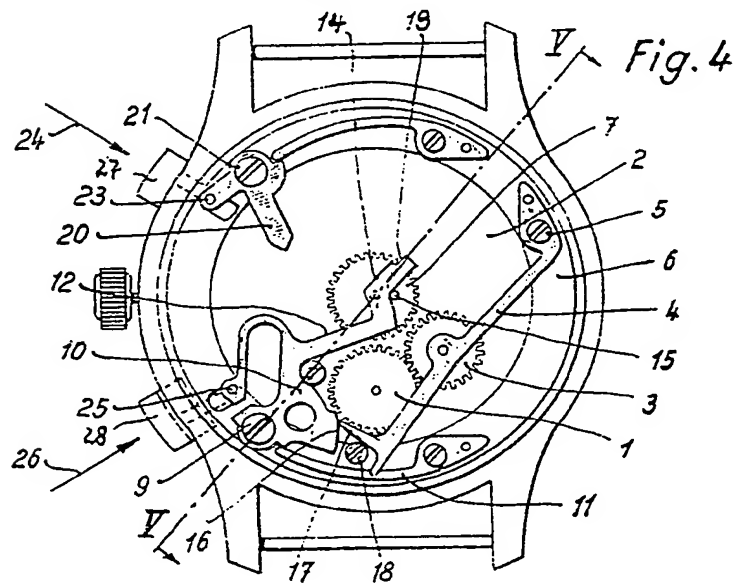
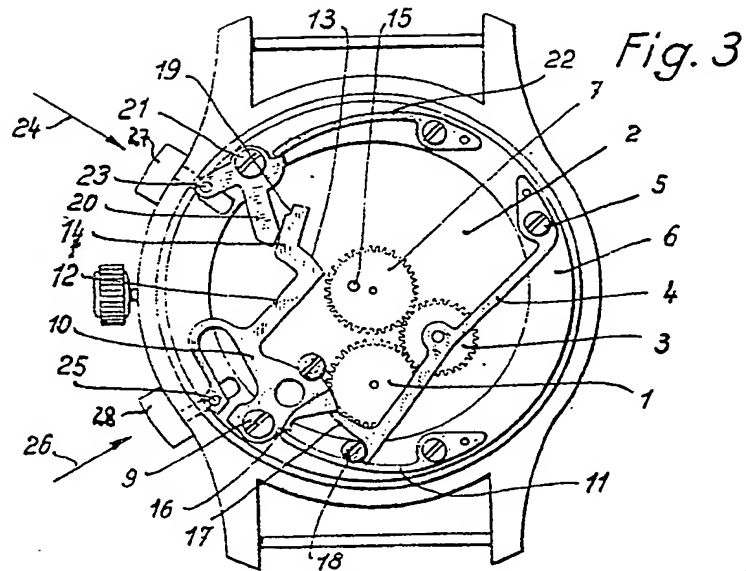


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SHEETS 1 & 2



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SHEETS 1 & 2

Fig. 1

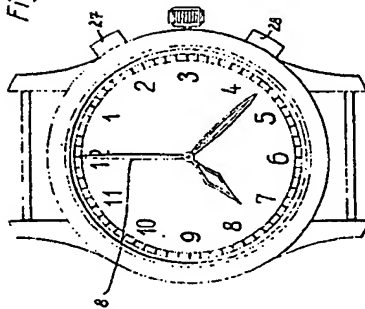


Fig. 2

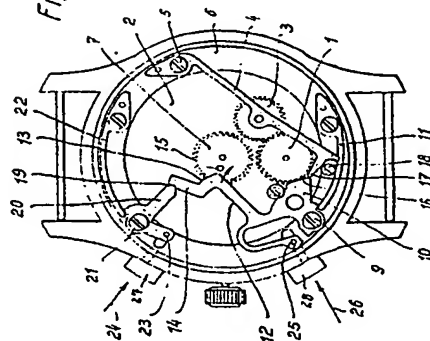


Fig. 3

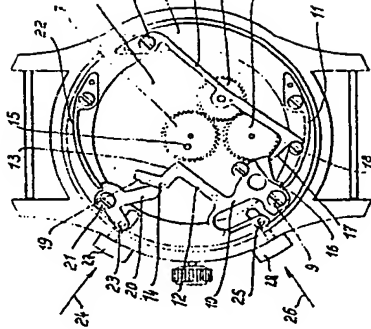


Fig. 4

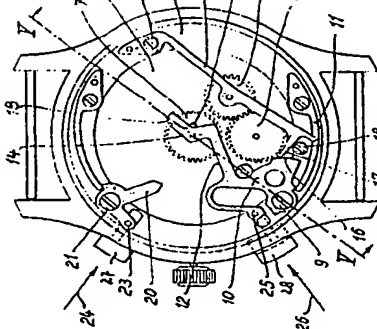


Fig. 5

